Space Weather Forecast

Issued on Tuesday, 26 March 2024 at 12:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Minor/Moderate radio blackouts (R1/R2) expected. A slowly reducing chance of Minor geomagnetic storms (G1) as coronal mass ejection (CME) influence eases.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity was moderate with the large sunspot region in the southwest producing three further low level moderate class flares in the past 12 hours. Eight active regions currently on the visible disc. The large region in the southwest quadrant (AR3615) remains by far the most complex group, with some spot consolidation evident in recent imagery. Changes in other groups were minor.

No further significant Earth-directed Coronal Mass Ejections (CMEs) observed on available imagery over the last 24hr.

Solar Wind / Geomagnetic Activity: The solar winds were initially at strong-very strong speeds (800 km/s) following the arrival of the CME associated with the strong flare on the 23rd March. From around 25/1500UTC winds began erratically declining to reach current strong speeds of around 630km/s. The interplanetary magnetic field (IMF) was at weak levels, with the important north-south parameter (Bz) weakly variable, but mainly positive/southward pointing. The net result of the above solar wind measures was initially Active (Kp4-5) geomagnetic conditions, which soon reduced to Quite to Unsettled (Kp 1 to 3).

Energetic Particles / Solar Radiation: Solar radiation was at S1 levels initially but on a slow and steady decline, falling below the S1 threshold from 25/1410UTC.

Four-Day Space Weather Forecast Summary
Solar Activity: Generally moderate solar activity is expected, with further Moderate flares expected from primarily the large and highly active region moving into the western disc through the forecast period, with a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: A coronal mass ejection (CME) associated with the strong flare on the 23rd March arrived at L1 at 24/1410UTC. There are no other Earth directed CMEs currently in the forecast.

Solar winds at current strong levels expected to decline erratically through day 1 (26 Mar) and into day 2 (27 Mar) as the impacts from the CME continue to wane. Winds are expected to continue to fall towards background values into day 3 and 4 (28-29 Mar) in the absence of forecast enhancements.

Generally Unsettled to Active conditions expected initially but with a steadily reducing chance of further G1/Minor storm conditions. By days 3 and 4 (28-29 Mar) conditions expected to become generally Quiet (Kp1-2) in the absence of any further CME enhancements.

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Energetic Particles / Solar Radiation: Solar radiation is continuing to decline from recent enhancement. A continued slow decline is expected in the absence of further significant flare activity.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	30	5	1
Strong	G3	No	5	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	80	80
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	40	30	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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